

## XII. A NOTE ON THE SKELETONS OF *BALAENOPTERA EDENI*, ANDERSON, IN THE INDIAN MUSEUM, CALCUTTA.

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(With Plate XV.)

In 1871 a whale was stranded in an inlet off the Gulf of Martaban. The skull and a portion of the skeleton were recovered and deposited in the Indian Museum where they were subsequently examined by Dr. John Anderson and described by him under the name *Balaenoptera edeni*<sup>1</sup>.

Since Dr. Anderson's paper there has been no critical study of this skeleton until my monograph<sup>2</sup> published in March, 1916, where it was considered in relation to *Balaenoptera borealis*, Lesson, which had been discovered in the Pacific Ocean in 1910.

After a detailed discussion of Anderson's account, I concluded my remarks upon the species in the following words: "While from the foregoing discussion of *B. edeni* it is evident that this species is either identical with, or closely allied to, *B. borealis*, I feel that without further information no positive assertions can be made regarding it. The characters of the skull and atlas which have already been pointed out are certainly of importance and to my mind cannot be disregarded or explained upon the grounds of individual variation. Since Dr. Anderson especially noted them from the specimen itself it would appear that they have not been exaggerated in the published figures. It is highly desirable that this skeleton be reexamined in the light of present knowledge of the large Cetacea, but until this is done, or other specimens have been obtained from the same waters, it appears to me that it is wisest to leave *Balaenoptera edeni* as a very doubtfully established species.

"It is especially unfortunate that Mr. Orjan Olsen, who has recently described *Balaenoptera brydei* from South African waters, did not furnish osteological details with his external descriptions. Further information regarding both these whales will be awaited with interest since it is not improbable that the two may prove identical, or both the synonyms of *B. borealis*. At present, however, the wisest course is to leave them as they are" (*l. c.*, p. 378).

In July, 1917, while *en route* to New York after a year of zoological exploration in Yün-nan province, China, I reached Calcutta and

<sup>1</sup> Anatomical and Zoological Researches: comprising an account of the Zoological Results of the Two Expeditions to Western Yunnan in 1868 and 1875. London, 1878, pp. 551-564, pl. xlv.

<sup>2</sup> Monographs of the Pacific Cetacea. II.—The Sei Whale (*Balaenoptera borealis*, Lesson). *Memoirs of the American Museum of Natural History*. New Series, Vol. I, Part VI, March 1916, pp. 376-378.

through the courtesy of Dr. N. Annandale, Superintendent of the Zoological Department of the Indian Museum, was given the opportunity to examine the type specimen of *Balaenoptera edeni* as well as a skeleton<sup>1</sup> referred to the same species which was secured on January 21, 1890, at Sidhi Island, Noakholly (Noakhali), Bengal, by C. E. F. Tommerre, Esq. The latter, I believe, has not been reported upon. Unfortunately I had to leave Calcutta rather hastily and was not able to examine the Sidhi Island skeleton in detail but several of the bones were removed from the storage case for my inspection.

The most important characters in which *B. edeni* differs from other species according to Anderson are in the skull and atlas. He says that the skull of this species is remarkable for the "little downward shelving of the upper surface of the maxillae;" also "in the character of its beak, which is long and slender, and much more forwardly directed than the beak of *B. schlegeli*" (= *B. borealis*).

These characters appeared to me to be of considerable importance from a study of Dr. Anderson's figures and I find that they truly represent the condition of the specimen. They are borne out, in a somewhat less degree, by a skull from Arakan (which was reported upon by Anderson) and in the Sidhi Island skull; unfortunately when I examined the latter the premaxillae were not in position but the bones appeared to be similar to those of the type.

The beaks of all three skulls are narrower at the base in proportion to the length and the breadth at the middle than are those of *B. borealis* and consequently the beak has a somewhat different shape. These characters appear to me to be of considerable importance but the others which Dr. Anderson mentions in his description are probably not beyond the limits of individual variation.

The atlas (pl. XV, figs. 1, 2) of this species is very interesting. Dr. Anderson remarks "The neural canal has considerable breadth (3 inches) and is much broader than high. The notch for the reception of the odontoid swelling of the axis lying below it is much contracted. The transverse process of the atlas is well-defined, rather long, but basally shallow; very different from the deep wing-like twisted transverse process of *B. schlegeli*, as figured and described by Flower. The articular surfaces of the axis practically meet below, being separated from each other by 0.25 inch in the dried bone, and have thus no facet between them as in *B. schlegeli* (= *B. borealis*), (*l. e.*, p. 558).

I verified Dr. Anderson's observations and drawings of the atlas from the type specimen and they are substantiated by the atlas of the Sidhi Island skeleton, figures of which are represented herewith. Comparison of the atlas of either of these specimens with any published figures of the corresponding bone of *B. borealis* will show immediately that the differences are just those which are pointed out by Dr. Anderson in the paragraph quoted above.

All of the skeletons of *B. borealis* upon which observations have been recorded, with one exception, have possessed cervical ribs ankylosed with the first thoracic ribs. Dr. Anderson remarks that a fragment of

<sup>1</sup> Specimen *b* in Selater's *Cat. Mamm. Ind. Mus.*, II, p. 314 (1891).

the first left rib of the type of *B. edeni* was preserved and that it was "single-headed." The Sidhi Island skeleton exhibits a bifurcated first rib exactly as in *B. borealis* as may be seen from the accompanying figures (figs. 3, 4). While the presence or absence of a cervical rib has no specific value, nevertheless it is interesting since in *B. borealis* its presence is almost universal (see Andrews, *l. c.*, pp. 367-368).

The Sidhi Island skeleton, so far as I was able to examine it, appears to substantiate the characters pointed out by Dr. Anderson in the type specimen of *B. edeni*. While in almost any other group of mammals these would be deemed sufficient reason for separation from even closely allied forms, yet any naturalist who is familiar with the extraordinary individual variation among cetaceans will realize that it is unwise to make positive statements based upon a limited amount of material.

It is difficult for me to believe that the differences exhibited by these skeletons can be individual, and yet they must be strengthened by a knowledge of the external anatomy before the species can be said to rest upon a firm foundation. There is no doubt that it is a form very closely allied to *B. borealis* and it may possibly prove to be identical with the recently described *Balaenoptera brydei* from South Africa of which only the external characters are known.